

REMARKS

This paper is being provided in response to the Office Action mailed October 9, 2009, for the above-referenced application. In this response, Applicant has amended claims 4, 6, 7 and 15 and added new claims 19-22 to clarify that which Applicant considers to be the presently-claimed invention. Applicant respectfully submits that the amendments to the claims and the new claims are fully supported by the originally-filed specification, consistent with the discussion herein.

The rejection of claims 4, 6, 7, 15 and 18 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,614,422 to Rafii, et al. (hereinafter "Rafii") in view of U.S. Patent No. 7,263,547 to Kloba (hereinafter "Kloba") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 4, as amended herein, recites a mobile communication terminal including an image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users. Operation detection means detects operation on the operation-plane image projected by the image projection means. Data processing means performs a predetermined data process based on the detection result of operation detected by the operation detection means. Application execution management means manages execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a

recognition function corresponding to the selected predefined operation-plane image. The image projection means projects the selected predefined operation-plane image corresponding to recognition function designated by designation information received from the application execution management means, from among the plurality of predefined operation-plane images. The operation detection means has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and detects operation on the operation-plane image by using the recognition function designated by the designation information received from the application execution management means. Claims 12 and 13 depend directly or indirectly from independent claim 4.

Independent claim 6, as amended herein, recites a mobile communication terminal including an image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users. Operation detection means detects operation on the operation-plane image projected by the image projection means. Data processing means performs a predetermined data process based on the detection result of operation detected by the operation detection means. Application execution management means manages an execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a recognition function corresponding to the selected predefined operation-plane image. The image projection means projects the selected predefined operation-plane image corresponding to the

recognition function designated by the designation information received from the application execution management means, from among the plurality of predefined operation-plane images. The operation detection means has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and detects operation on the operation-plane image by using the recognition function corresponding to the operation-plane image designated by the designation information received from the application execution management means. Claims 12 and 13 depend directly or indirectly from independent claim 6.

Independent claim 7, as amended herein, recites a mobile communication terminal including an image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users. Operation detection means detects operation on the operation-plane image projected by the image projection means. Data processing means for performing a predetermined data process based on the detection result of operation detected by the operation detection means. Memory means for stores a plurality of image data corresponding to each one of the plurality of operation-plane images. Application execution management means executes an application program selected from a plurality of kinds of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a recognition function corresponding to the selected predefined operation-plane image. Instruction generation means generates an operation-plane image selection instruction in accordance with content of the selected application program. The image projection means selects an image data

from the plurality of image data memorized in the memory based on the operation-plane image selection instruction generated by the instruction generation means, and projects the operation-plane image of the selected image data. The application execution management means performs a data process corresponding to operation detected by the operation detection means in accordance with the content of the application program during execution of the selected application program and in accordance with the designation information that designates the recognition function. Claims 12 and 13 depend directly or indirectly from independent claim 7.

Independent claim 15, as amended herein, recites a mobile communication terminal. An image projector projects a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device. An operation detector detects operation on the operation-plane image projected by the image projector. A data processor performs a predetermined data process based on the detection result of operation detected by the operation detector. An application execution management device manages an execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management device selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a recognition function corresponding to the selected predefined operation-plane image. The image projector projects an operation-plane image corresponding to the recognition function designated by the designation information received from the application execution management device, from among the plurality of predefined operation-plane images. The operation detector has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation

object on the plurality of predefined operation-plane images, and detects operation on the operation-plane image by using the recognition function designated by the designation information received from the application execution management device. Claims 16-18 depend from independent claim 15.

Rafii discloses a method and apparatus for entering data using a virtual input device. A user inputs digital data to a companion system using a virtual input device and a sensor captures three-dimensional positional information as to location of the user's fingers in relations to where keys would be on an actual keyboard. The Office Action cites principally to col. 4, lines 27-33, col. 7, lines 16-18, col. 10, lines 27-34 and col. 12, lines 33-47 and Figs. 1A and 3 of Rafii. The Office Action (page 3) notes that Rafii does not disclose an application execution management means for managing application program execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network.

Kloba discloses a system, method and computer program product for customizing channels, content and data for mobile devices. The Office Action cites to Kloba as disclosing the feature of an application execution management means for managing execution environment of an application program selected from a plurality of application programs downloaded via a mobile communication network, citing specifically to col. 4, lines 37-41; col. 7, lines 5-9; and col. 11, lines 15-21 of Kloba.

Applicant's system, in accordance with the disclosure and the present claims, provides that a plurality of projected input layouts, namely predefined operation-plane images, are pre-

programmed into a device and a particular selected on those predefined operation-plane images may be selected based on the content (e.g., according to the requirements of) the application program. In addition to selecting the predefined operation-plane image based on the content, the application execution management means also generates designation information that designates a designated recognition function corresponding to the selected predefined operation-plane image. (See, for example, paragraphs [0008]-[0012] of the originally-filed specification).

For example, for an application program that requires a virtual keyboard, the application execution management means may select an appropriate keyboard and provide appropriate designation information for other components, such as a operation detection component, to be able to correctly recognize and operate with the movements of user that is using the predefined operation-plane image of the keyboard. Alternatively, for example, for an application program that requires a musical instrument keyboard (such as a piano), then the application execution management means selects the appropriate predefined operation-plane image and generates the appropriate designation information for a recognition function to provide suitable operation of the system. Other predefined operation-plane images may include game controllers and/or 3D input layouts and for which the system described herein may be provide appropriate selection, projection and operation features based on the content (requirements) of the application program (See, for example, paragraphs [0018], [0052] of the originally-filed specification).

Further, Applicants have clarified with amendments herein that Applicant's recited system provides for using the designated recognition function in connection with detecting operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and wherein at least part of the selected

operation-plane image is changed during the operation on the selected operation-plane image according to detection of the operation content using the designated recognition function, as recited by Applicant. For example, the change of the operation-plane image may include a change in color and luminance of changed parts of the operation-plane image and/or may include a change of image represented in the change part to other images (e.g., a different image). Applicant refers, for example, to page 9, line 11 to page 10, line 1 of the originally-filed specification.

Applicant respectfully submits that the cited prior art does not teach or fairly suggest at least Applicant's above-noted features. With respect to "a plurality of operation-plane images," the Office Action (see, e.g., page 18) cites to col. 4, lines 13-33, col. 8, lines 7-24 and col. 7, lines 64 to col. 8, line 1, citing Rafii as providing for images such as a keyboard, grid or "blank" image, and specifically noting the possible use of alternate key sets, such as for different languages or key sets laid out in differing matrix patterns. As discussed above, Applicant's have clarified the claims herein to recite that at least part of the selected operation-plane image is changed during the operation on the selected operation-plane image according to detection of the operation content using the designated recognition function. Applicant describes advantages of such image changing during operation of the operation-plane image as allowing for users to be able to detect operation errors while looking at the operation-plane image. (See, e.g., page 9, lines 18-23 of the originally-filed specification.) For example, during operation, in connection with detected operation content according to a designated recognition function, part of the selected operation-plane image may be changed in color, luminance or even using a different image (note new claims 19-22).

Rafii does not disclose the changing of a projected image during operation according to detected content of the operation. That is, although the Office Action has identified in Rafii disclosure of the possible projection of different keyboard images (e.g., keyboards for different languages), Rafii is silent as to any changing of the projected image during operation. It is particularly noted that Rafii's principal embodiment is the use of a substrate keyboard rather than a projected image, but then notes at col. 4, lines 27, that: "If desired, in lieu of a substrate keyboard, the invention can include a projector that uses light to project a grid or perhaps an image of keyboard onto the work surface in front of the companion device. The projected pattern would serve as a guide for the user in 'typing' on this surface." Rafii's discussion of the projected pattern contains no disclosure of changing of that projected image during the operation. Indeed, at col. 4, lines 34-50, Rafii specifically provides for the use of a display screen to display alphanumeric characters as they are 'typed'. To help users that are not accomplished typists, Rafii provides for modification of colors or contrast of keys typed by a user (or under a user's fingers) *on the display screen*, but again, Applicant submits that Rafii is entirely silent as to any *change of the projected image* of the keyboard during operation and according to detected operation content.

Applicant respectfully submit that the addition of Kloba does not overcome the above-noted deficiencies of Rafii with respect to Applicant's presently-claimed invention. Kloba does not disclose, nor is Kloba cited in the Office Action in connection with, Applicant's recited features that are discussed above with respect to Rafii. Accordingly, Applicant submits that Rafii and Kloba, taken alone or in any combination, do not teach or fairly suggest at least the above-noted features as presently recited by Applicant. In view of the above, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

The rejection of claim 12, 13, 16 and 17 under 35 U.S.C. 103(a) as being unpatentable over Rafii in view of Kloba and further in view of U.S. Patent App. Pub. No. 2002/0075240 to Lieberman (hereinafter "Lieberman") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claims 4, 6, 7 and 15 are discussed above with respect to Rafii and Kloba. Claims 12, 13, 16 and 17 depend therefrom.

Lieberman discloses a virtual data entry device and method for input of alphanumeric and other data. The Office Action cites to Lieberman as disclosing features of use of a light source, a spatial light modulation unit and an optical system, as recited by Applicant in claim 12, citing specifically to paragraphs 0184, 0186, 0135 and Figs. 28 and 29 of Lieberman.

Applicant respectfully submits that the addition of Lieberman does not overcome the above-noted deficiencies of Rafii and Kloba with respect to the presently-claimed invention. Lieberman does not disclose, nor is Lieberman cited in the Office Action in connection with, Applicant's recited features that are discussed above with respect to Rafii and Kloba. Accordingly, Applicant respectfully submits that Rafii, Kloba and Lieberman, taken alone or in any combination, do not teach or fairly suggest at least the above-noted features as recited by Applicant. In view of the above, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,
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